

CLAIMS

1. Xylanase, characterized in that it originates from a *Bacillus* strain and in that it is active over a pH range between approximately 5 and 10 and over a temperature range between approximately 50 and 80°C.

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2. Xylanase, characterized in that it originates from *Bacillus* sp. strain 720/1 (LMG P-14798) or from a derivative or mutant of this strain.

3. Isolated and purified xylanase, characterized in that it comprises the amino acid sequence from 1 to 221 10 amino acids (SEQ ID NO:3) or a modified sequence derived from this sequence.

4. Xylanase according to Claim 3, characterized in that it is synthesized in the form of a precursor containing 248 amino acids (SEQ ID NO:6).

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5. Xylanase, characterized in that it consists of a single polypeptide having a molecular weight of approximately 25 kDa, and in that it has a determined isoelectric point of between approximately 9.5 and 20 approximately 9.7.

6. Xylanase, characterized in that it is produced heterologously by a microorganism of the genus *Bacillus*.

7. An isolated and purified culture of *Bacillus* sp. 720/1 (LMG P-14798) and culture derived or mutated from 25 this culture.

8. DNA molecule comprising the nucleotide sequence (SEQ ID NO:1) which codes for the mature xylanase of *Bacillus* sp. 720/1 (LMG P-14798) or a modified sequence derived from this sequence.

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9. DNA molecule according to Claim 8, characterized in that it comprises the nucleotide sequence (SEQ ID NO:4) which codes for the *Bacillus* sp. 720/1 xylanase precursor or a modified sequence derived from this sequence.

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10. DNA molecule according to Claim 8 or 9, characterized in that it comprises the entire *Bacillus* sp. 720/1 xylanase gene (SEQ ID NO:10).

11. DNA molecule according to Claim 8, characterized in that it comprises the promoter (SEQ ID NO:26) derived

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from the gene which codes for *Bacillus pumilus* PRL B12 xylanase, the presequence (SEQ ID NO:27) which codes for the signal peptide of *Bacillus pumilus* PRL B12 xylanase and the nucleotide sequence (SEQ ID NO:1) which codes for 5 *Bacillus* sp. 720/1 xylanase.

12. Expression vector or chromosomal integration vector containing the DNA molecule according to Claim 8, 9, 10 or 11.

13. Expression vector pUBRD-720X11.

10 14. Expression vector pBPXD-PRE-720X.

15. Transformed strain comprising the DNA molecule according to Claim 8, 9, 10 or 11.

16. Transformed strain comprising the expression vector or the chromosomal integration vector according to

15 Claim 12, 13 or 14.

17. Transformed strain according to Claim 15 or 16, characterized in that it is a *Bacillus* strain.

18. Transformed strain according to Claim 17, characterized in that it is a *Bacillus licheniformis* or *Bacillus pumilus* strain.

19. Xylanase produced by the transformed strain according to Claim 15, 16, 17 or 18.

20. Method for the production of a xylanase according to any one of Claims 1 to 6 or according to Claim 19, 25 characterized in that it comprises the culturing of a strain capable of producing xylanase in a suitable nutrient medium containing carbon and nitrogen sources and inorganic salts under aerobic conditions, and the harvesting of the xylanase thereby obtained.

30 21. Method for the preparation of a xylanase according to any one of Claims 1 to 6, characterized in that it comprises isolation of a DNA fragment coding for the xylanase, the insertion of this DNA fragment into a suitable vector, the introduction of this vector into a 35 suitable host or the introduction of this DNA fragment into the chromosome of a suitable host, the culturing of this host, the expression of the xylanase and the harvesting of the xylanase.

22. Use of a xylanase according to any one of Claims

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1 to 6 or according to Claim 19, for the treatment of paper pulp.

23. Use of a xylanase according to any one of Claims 1 to 6 or according to Claim 19 in animal feeds.

5 24. An enzyme composition containing a xylanase according to any one of Claims 1 to 6 or according to Claim 19, and at least one additive.

25. Promoter (SEQ ID NO:26) derived from the gene which codes for *Bacillus pumilus* PRL B12 xylanase.

10 26. Presequence (SEQ ID NO:27) which codes for the
signal peptide of *Bacillus pumilus* PRL/B12 xylanase.

27. Expression system which can be used for the production of a polypeptide, characterized in that it comprises:

15 - the sequence of the promoter (SEQ ID NO:26) derived
from the gene which codes for *Bacillus pumilus* PRL
B12 xylanase,
- a sequence coding for a signal peptide, and

20 28. Expression system which can be used for the production of a polypeptide, characterized in that it comprises:

25 - the sequence of a promoter,
- the presequence (SEQ ID NO:27) which codes for the
signal peptide of *Bacillus pumilus* PRL B12 xylanase,
and
- the sequence of the polypeptide of interest.

29. Expression system which can be used for the production of a polypeptide, characterized in that it

35 - the sequence of the promoter (SEQ ID NO:26) derived from the gene which codes for *Bacillus pumilus* PRL B12 xylanase,

- the presequence (SEQ ID NO:27) which codes for the signal peptide of *Bacillus pumilus* PRL B12 xylanase,

- the sequence of the polypeptide of interest, and

- the sequence of a terminator.

30. Expression system according to Claim 27, 28 or 29, characterized in that the sequence of the polypeptide

of interest corresponds to the nucleotide sequence (SEQ ID NO:1) which codes for ~~Bacillus~~ sp. 720/1 xylanase.

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